

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 July 2003 (17.07.2003)

PCT

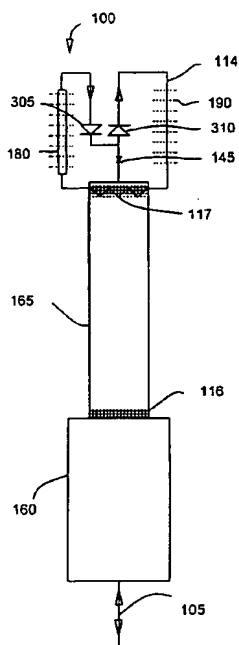
(10) International Publication Number
WO 2003/058666 A3

- (51) International Patent Classification⁷: **F25B 9/00**
- (21) International Application Number:
PCT/US2003/000381
- (22) International Filing Date: 8 January 2003 (08.01.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/346,701 8 January 2002 (08.01.2002) US
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- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, IIR, IU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PI, PL, PT, RO, RU, SD, SE, SG, SK, SI, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: PULSE TUBE COOLING BY CIRCULATION OF BUFFER GAS

(57) Abstract: The present invention applies to single or two stage pulse tube (165) refrigerators that have one or more passive orifices (145) at the hot end(s) of the pulse tube(s) through which gas flows to achieve phase shifting and the phase shifting gas flow (114) circulates to a remote heat sink by adding check valves (305, 310) and an appropriate piping circuit.



WO 2003/058666 A3

WO 2003/058666 A3



Published:

— with international search report

(88) Date of publication of the international search report:

19 February 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

10 Rec'd PCT/PTO 02 JUL 2004

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/00381

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : F25B 9/00

US CL : 62/6

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 62/6

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
None

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
None

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,966,942 A (MITCHELL) 19 October 1999 (19.10.1999), see figures 11 and 13 and col. 13 lines 41-63.	1-3,8
Y	US 6,256,998 B1 (GAO) 10 July 2001 (10.07.2001), see figures 3,5,8 and 9	1-9
Y	JP 04-225755 A (SANYO ELECTRIC CO, LTD.) 14 August 1992 (14.08.1992), see figures 1 and 3.	1-9
A	US 6,094,921 A (ZHU et al) 01 August 2000 (01.08.2000), see figures 6,9 and 11.	1
A,P	US 6,351,954 B1 (NOGAWA et al) 05 March 2002 (05.03.2002), see entire document.	1
X	US 5,720,172 A (ISHIZAKI) 24 February 1998 (24.02.1998), see figures 3a,3b,12a,12b.	1,3,7-9
A	US 5,966,943 A (MITCHELL) 19 October 1999 (19.10.1999), see entire document.	1-9

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

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"&"

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Date of the actual completion of the international search

30 May 2003 (30.05.2003)

Date of mailing of the international search report

16 JUL 2003

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